Claims

I claim as my invention:

1.A loudspeaker comprising a rigid frame around an elongated relatively thick oscillating member made of stiff, low density and sound absorbing material. The oscillating member does not have to be rectangular or planar. The thickness does not have to be constant. At least one permanent magnetic driver has its voice coil attached to the backside of the oscillating member and its permanent magnet assembly mounted on a bridge along the width of the frame.
The oscillating member is mounted onto the frame via a minimum number of pivoting points distributed along the major dimension, which is lengthwise. These pivoting points are set in pairs along the second dimension of the oscillating member, which is the width. The axis of such pairs of pivoting points are chosen to cross certain points of interest along the first dimension of the oscillating member, the length, like one end of the oscillating member, the center of mass of the entire oscillating member, the center of mass of parts of the oscillating member, the center of percussion of the entire oscillating member about a certain axis of rotation or the center of percussion of parts of the oscillating member about a certain axis of rotation.
In a particular case a unidirectional flexing element can be installed at one or both ends in the longitudinal direction along the width of the oscillating member.

2. A loudspeaker, as described in claim 1, having the first end of the oscillating member mounted between a pair of pivots, the second end of the oscillating member mounted on a flexible element and the voice coil attached in the area of the center of percussion of the entire oscillating member about the first end of the oscillating member.

3. A loudspeaker, as described in claim 1, having the first end of the oscillating member mounted between a pair of pivots, the second end of the oscillating member mounted on a flexible element and the voice coil attached in the area of the center of percussion of the part of the oscillating member between the center of mass of the entire oscillating member and the second end of the oscillating member, about the axis of the center of mass of the entire oscillating member along the width of the oscillating member.

4. A loudspeaker, as described in claim 1, having the first end of the oscillating member mounted on a flexible element. The center of mass of the entire oscillating member finds itself on the axis of a pair of pivoting points. The second end of the oscillating member is mounted on a flexible element.
A first voice coil is attached in the area of the center of percussion of the part of the oscillating member between the first end of the oscillating member and the axis of the pivoting points, about the axis of the pair of pivoting points.

A second voice coil is attached in the area of the center of percussion of the part of the oscillating member between the axis of the pivoting points and the second end of the oscillating member, about the axis of the pivoting points. Each voice coil works in conjunction with its own permanent magnet assembly mounted each on a bridge along the width of the loudspeaker.

5. A loudspeaker, as described in claim 4, having the first voice coil in the center of mass of part of the oscillating member between the first end of the oscillating member and the first center of percussion as defined in claim 4 and the second voice coil in the center of mass of part of the oscillating member between the second end of the oscillating member and the second center of percussion as defined in claim 4.

6. A loudspeaker as described in claim 1, having the first end of the oscillating member mounted between a first pair of pivoting points. A second pair of pivoting points is set in the area of the center of percussion of the entire oscillating member about the axis of the first pair of pivoting points.
The voice coil is attached in the area of the center of mass of the entire oscillating member.

7. A loudspeaker, as described in claim 1, having the first end of the oscillating member mounted between a first pair of pivoting points and the voice coil in the center of mass of the entire oscillating member. The second pair of pivoting points is installed in the area of the center of percussion of part of the oscillating member between the center of mass of the entire oscillating member and the second end of the oscillating member, about the axis of the center of mass of the entire oscillating member.

8. A loudspeaker, as described in claim 1, having a first pair of pivoting points around the center of percussion of the quarter of the entire oscillating member containing the first end of the entire oscillating member about the center of mass of the half of the entire oscillating member containing the first end of the entire oscillating member. The second pair of pivoting points is installed in the area of the center of percussion of the half of the entire oscillating member containing the second end of the entire oscillating member about the center of mass of the entire oscillating member. The voice coil is placed in the area of the center of mass of the entire oscillating member.

9. A loudspeaker, as described in claim 1, having the voice coil in the center of mass of the entire oscillating member. The first pair of pivoting points is installed in the area of a first center of percussion of the part of the oscillating member between the first end of the oscillating member and the center of mass of the entire oscillating member, about the axis of the center of mass of the entire oscillating member. The second pair of pivoting points is installed in the area of a second center of percussion of the part of the oscillating member between the center of mass of the entire oscillating member and the second end of the oscillating member, about the center of mass of the entire oscillating member.

10. A loudspeaker, as described in claim 9, having the first pair of pivoting points shifted from the first center of percussion into the center of mass of part of the oscillating member from the first end of the oscillating member to the first center of percussion and the second pair of pivoting points shifted from the second center of percussion into the center of mass of part of the oscillating member between the second end of the oscillating member to the second center of percussion.

11. A loudspeaker, as described in claim 4, having no pivoting points in the area of the center of mass.

12. A loudspeaker, as described in claim 5, having no pivoting points in the area of the center of mass.

13. A loudspeaker, as described in claims 2,3,4,5,11 and 12, having instead of unidirectional flexing elements, in their location, a pair of pivoting points installed as in claim1.

14. A loudspeaker, as described in claims 6,7,9 and 10, having the free overhanging ends of the oscillating member replaced with dynamic counterbalancing weights.

15. A loudspeaker, as described in claims 1,2,3,4,5,6,7,8,9,10,11,12,13 and 14, having at least one cavity in the oscillating member in order to control the average density and improve sound absorption. The cavity is air filled.

16. A loudspeaker, as described in claim 15, having the cavity filled with a gas, other than air.

17. A loudspeaker, as described in claims 1,2,3,4,5,6,7,8,9,10,11,12,13,14, 15 and 16, having at least two voice coils attached in a row along the width of the oscillating member in order to increase the width of the assembly without compromising the very concept of the present invention.

18. A loudspeaker, described in claims 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16 and 17, set in a horizontal position, having the electromagnetic driver or drivers facing upwards, being able to hold a heat transferring fluid in the cavity of the permanent magnet assembly. The permanent magnet assembly or assemblies, if needed can be surrounded by stationary heat sink structures or even a fan forced cooling system.

19. A loudspeaker, as described in claims 1,2,3,4,5,6,7,8,9 and 10, having all pivoting points replaced with flexible elements.